

the body. Antennae short, with antennal setation 0-0-1-3/1-1-3. Setae long. Posterodorsal corner of valve angular, posteroventral corner ends in an obliquely directed shell spine (mucro) and is about 2.1 mm long. Seta Kurzi lies just above the commencement of mucro. Anterior ventral valve has several plumose setae. Postabdomen short, quadrangular and ends in a long stout claw. Claw with three groups of spines, proximal pecten of 5-7 small spines, intermediate pecten of 6-8 stout, strong spines which increase in length distally, distal pecten of 10-12 spines continuing distally into minute spinules up to tip of claw.

The above description of *Bosmina tripurae* conforms well with the description of the species given by Korínek *et al.*, 1999, except that the present material is larger in size, and therefore varies in the number of spines in the claws. Saha and Bhattacharya (1991) recorded the genus from Tripura. Later, Korínek *et al.* (1999) studied the same material and treated it as a new species. However, Korínek *et al.* (loc. cit.) described the species from another conspecific population from Tamil Nadu. The species was found to occur in

association with other cladocerans, namely *Daphnia* sp., *Ceriodaphnia* sp., *Moina* sp. and *Simocephalus* sp. The present report of the species thus extends its distribution.

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REFERENCES

- KORÍNEK, V., R.K. SAHA & T. BHATTACHARYA (1999): A new member of the subgenus *Sinobosmina* Leiden, 1957: *Bosmina tripurae* sp. nov. (Crustacea, Cladocera) from India. *Hydrobiologia* 392: 241-247
SAHA, R.K. & T. BHATTACHARYA (1991): Dispersion pattern of Cladocera in two shallow ponds. *J. Inl. Fish Soc. India* 23: 27-33.

29. ON THE DAMAGE CAUSED TO THE GREEN MUSSEL
PERNA VIRIDIS BY PINNOTHERID CRAB *PINNOTHERES CASTA*
ANTONY & KUTTYAMMA, 1971 ALONG THE CALICUT COAST

The occurrence of pea crab *Pinnotheres* in oysters, clams, ascidians, holothurians and brachiopods has been reported from various parts of the world (Thompson 1835, Tesch 1918, Chhapgar 1955, Munsueti 1955, Yonge 1960 and Durve 1960). Silas and Alagarwami (1967) reviewed the pea-crabs (*Pinnotheres* spp.) and dealt with their systematics, ecology, biology and ethology. They also studied their occurrence and the effects of their infestation on *Meretrix casta* from the southwest coast of India. Antony and

Kuttyamma (1971) described a new species of *Pinnotheres*, *P. casta* from *Meretrix casta*, which Silas and Alagarwami (1967) had left unnamed. Information on the pea crabs of India is rather meagre, but for the study of Silas and Alagarwami (1967).

Pea crabs are small, with carapace width ranging from 10-12 mm. The genus is recognized by the third pair of walking legs (WL) which are longer than other pairs, and dactyli of 3rd and 4th walking legs being larger than the 1st and 2nd

walking legs. *Pinnotheres casta* is distinguished from other species of the genus by its orbicular carapace.

Green mussels form an important subsidiary fishery along the west coast of Malabar, Kerala. About 5,400 metric tonnes of green mussels are harvested along the southwest coast annually. Pinnotherid infestation causes considerable loss to the mussel-catching fisherman.

Two hundred green mussels were collected from the mussel beds off West Hill beach, Kozhikode during January 1998. The mussels were opened, and the Pinnotherid crabs removed from the mantle cavity. The soft parts of the mussels were weighed to the nearest milligram and the damage caused by *Pinnotheres* was noted. The wet weight, dry weight, fat and protein contents of the infested and non-infested mussels were analysed and tabulated (Tables 1 & 2).

The average wet weight of the mussels infested by the crab was 6.20 g, whereas that of non-infested crabs was 11.18 g. The average dry weight of the infested mussel was 1.10 g, but that of non-infested was 2.77 g indicating a loss of about 55.45% of wet weight and 39.7% of dry weight (Table 1). The average protein content of infested and non-infested mussels was 56% and 64.5% respectively. The fat content was 8.66% in the non-infested mussels and 5.66% in the infested mussels. The incidence of infestation was found to be 11% during January 1998.

Silas and Alagarwami (1967) found that 48% of the clams (*Meretrix casta*) examined from Malpe (southwest coast of India) harbored the Pinnotherid crab; 83.1% of the infestation had one crab, 13.1% had two and 3.8% had 3 crabs. In this case, however, 90% of *Perna viridis* had only one crab and 10% had two crabs.

Silas and Alagarwami (1967) found that *Pinnotheres* were parasitic on *Meretrix casta*. Strauber (1942), and Christiansen & McDermitt (1958) recorded them on the American oyster *Ostrea virginica*. Our observation also confirms the parasitic nature of *Pinnotheres*, and *Perna*

TABLE 1
WET WEIGHT AND DRY WEIGHT
OF GREEN MUSSEL (*PERNA VIRIDIS*)
INFESTED BY PINNOTHERID CRAB

	Wet Weight		Dry Weight	
	Infested (g)	Non-Infested (g)	Infested (g)	Non-Infested (g)
1.	6.05	13.00	1.005	
2.	5.90	12.80	0.10	
3.	7.30	10.55	1.32	3.05
4.	4.37	9.02	0.64	3.15
5.	8.67	12.95	1.60	2.57
6.	4.91	11.32	0.75	2.05
7.	7.00	14.17	1.05	4.00
8.	6.90	7.95	1.15	2.94
9.	9.40	8.87	1.90	3.42
10.	4.84		0.80	1.73
11.	6.50		1.32	2.02
12.	6.57		1.55	
13.	9.25		1.93	
14.	8.49		1.15	
15.	6.88		0.71	
16.	4.58		0.52	
17.	3.44		0.87	
18.	4.26		0.37	
19.	2.50			
	\bar{X} 6.20	\bar{X} 11.18	\bar{X} 1.10	\bar{X} 2.77

TABLE 2
PROTEIN AND FAT CONTENT OF INFESTED
AND NON-INFESTED *PERNA VIRIDIS*

	Infested	Non infested
Protein %	56.00	66.50
	56.00	64.75
		<u>62.00</u>
	<u>56.00</u>	64.41
Fat	7.00	8.00
	5.00	9.00
	<u>5.00</u>	<u>9.00</u>
	5.00	8.66

viridis was found to be a new host for *Pinnotheres casta*.

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REFERENCES

- ANTONY, A. & V.J. KUTTYAMMA (1971): A new species of the pea-crab *Pinnotheres* Latreille (Crustacea: Brachyura: Pinnotheridae) from the clam, *Meretrix casta* Chemnitz. *Bull. Dept. Mar. Biol & Oceano.* (5): 59-68.
- CHHAPGAR, B.F. (1955): On two new species and a new variety of crabs (Decapoda : Brachyura) from Bombay state. *Rec. Ind. Mus.* 53: 251-260.
- CHRISTIANSEN, A.M. & J.J. McDERMITT (1958): Life history and biology of the oyster crab *Pinnotheres ostreum* Say. *Biol. Bull.* 114: 146-179.
- DURVE, V.S. (1960): A Study on Oysters. Ph.D. thesis, University of Bombay.
- MANSUETI, R. (1955): The oyster's messmate. *Nature Mag.* 48(3): 125-127.
- SILAS, E.G. & K. ALAGARSWAMI (1967): On an instance of parasitization by the pea crab (*Pinnotheres* sp.) on the backwater clam *Meretrix casta* (Chemnitz) from India, with a review of the work on the systematics, ecology, biology and ethology of pea crab of the genus *Pinnotheres* Latreille, *Symp. Crustacea.* Part III: 1161-1227.
- STRAUBER, L.A. (1942): The oyster crab *Pinnotheres ostreum*, parasitic on the oyster. *Anat. Rec.* 84: 45-46.
- THOMPSON, J.V. (1835): Memoirs on the metamorphosis and natural history of the *Pinnotheres* or pea crabs. *Entomol. Mag.* 3: 85-90.
- TESCH, J.J. (1918): The Decapoda Brachyura of the Siboga Expedition 11. Goneplacidae and Pinnotheridae. *Siboga Exped. Rep.* 39cl. 295. 19 pls.
- YONGE, C.M. (1960): Oysters. Collin's, St. James Place, London, pp. 118.

30. PRELIMINARY STUDIES ON SPIDER DIVERSITY AND THEIR WEBS IN SELECTED SACRED GROVES IN KERALA

Nature worship has been an ancient Indian tradition and all forms of life have been considered as sacred in Hindu scriptures. Certain landscapes or plants were also considered sacred. These sacred groves are pockets of climax vegetation preserved by religious sentiments. Such pockets are commonly referred to as "Kavu" in Malayalam, "Devarais" in Marathi, "Pavithravanam" or "Sindhra vanam" in Kannada and "Kadu" in Tamil (Induchoodan 1988). It is well known that the sacred trees such as banyan, peepal and other species of *Ficus* support a variety of life forms.

Spiders may be sedentary, social and could be cannibalistic. They are skilful hunters (Lococids), jumpers (Attids), excellent architects and specialized swimmers. All spiders are carnivorous. They are distributed extensively in the field, thick forest floors as well as in the human habitations and deserted buildings, under stones and logs and the tree trunks. Some of the spiders like *Araneus*, *Argiope*, *Leucauge* and *Gasteracantha* are orb web weavers. Members of Family Pholcidae make irregular webs, while those of Family Eresidae construct compact nests

with many entrance holes. These nests are most commonly found in India on Acacia trees and shrubs. Some of the spiders prepare no webs or snares to catch their prey. Families Lycosidae, Gnaphosidae, Clubionidae, Sparassidae, Salticidae, Oxyopidae and Thomisidae are hunting or running spiders. The role of spiders in the biogenesis of different agro-ecosystems has been studied since 1943 (Kagan 1943, Whitcomb *et al.* 1963, Whitcomb and Bell 1964, Neyffler and Benz 1979, 1980, Doane and Dondale 1979, Doane *et al.* 1982). They have an important role in controlling pests. Crab spiders are of tremendous economic relevance in tropical countries as they capture and feed on cockroaches and domestic insect pests. *Heteropoda venatoria*, the giant crab spider could be effectively used to control cockroaches and other insect pests because of its preference for these creatures as prey.

Iringole Sacred Grove: The Iringole sacred grove is situated in Perumbavoor, Ernakulam district, Kerala. It is spread around about 10 ha and lies between 10° 10' N and 76° 30' E. The grove is more or less at sea level. The